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EXAMINER

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Paper No. 15

Application Number: 09/059,865

Filing Date: 4/14/98

Appellant(s): Iyer

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GROUP 2800

Diana M. Sangalli
For Appellant

EXAMINER'S ANSWER

This is in response to appellant's brief on appeal filed 2/3/00.

(1) *Real Party in Interest*

A statement identifying the real party in interest is contained in the brief.

(2) *Related Appeals and Interferences*

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A statement of Appellant is unaware of any other appeals or interferences related to this appeal is contained in the Brief.

(3) *Status of Claims*

The statement of the status of the claims contained in the brief is correct.

(4) *Status of Amendments After Final*

No final rejection has been issued.

(5) *Summary of Invention*

The summary of invention contained in the brief is incorrect. The term "undesirable residue" is not disclosed in the original specification.

(6) *Issues*

The appellant's statement of the issues in the brief is correct.

(7) *Grouping of Claims*

Claims 12-17 and 18-23 should be stand or fall together because Appellant *fails* to provide reasons for claims 12, 18 will stand or fall separately, dependent claims 13-17 will stand or fall with independent claim 12, dependent claims 19-23 will stand or fall with independent claim 18.

(8) *ClaimsAppealed*

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) *Prior Art of Record*

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The following is a listing of the prior art of record relied upon in the rejection of claims under appeal.

5,466,637 Kim 11/14/95

5,391,508 Matsuoka et al. 2/21/95

(10) *Grounds of Rejection*

The following ground(s) of rejection are applicable to the appealed claims:

A. Claims 18-23 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The limitation “undesirable residual” in claim 18 contains subject matter which was not described in the original specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor. It is suggested to delete “undesirable”.

B. Claims 12-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (U.S. Patent No. 5,466,637) in view of Matsuoka et al. (U.S. Patent No. 5,391,508).

Kim teaches a method of manufacturing an integrated circuit comprising the steps of: forming features on a substrate, the features protruding from the substrate to create creases adjacent the features (12, 13, 14), depositing a layer of non-dielectric material (stringer) (18, silicon) over the features and the creases, removing a portion of the non-dielectric material from the creases using a given method, leaving undesirable residual non-dielectric material in some of

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the creases, and converting the undesirable residual non-dielectric material in the creases into a dielectric material (22, oxide) (see figures 1-2, col.2, lines 50-68).

However, the reference does not teach removing a portion of the non-dielectric material, and nitridizing the non-dielectric material.

It is well-known in the art to form a non-dielectric material (silicon) over the protruding on substrate.

Therefore, it would have been obvious to one of ordinary skill in the requisite art at the time of the invention was made to remove a portion of the non-dielectric material to left the undesirable residual because the technique is well-known in the art.

Matsuoka et al teaches that silicon nitride side walls may be used, rather than silicon oxide (see column 16, lines 10-15).

Therefore, it would have been obvious to one of ordinary skill in the requisite art at the time of the invention was made to provide silicon nitride sidewall, in place of oxide sidewalls, in the Kim process, as taught by Matsuoka et al because it is shown that it is known in the art that silicon nitride function effectively as a sidewall and because silicon nitride is a better diffusion barrier and etch stop than silicon oxide and would therefore better protect the gate electrode.

C. Claims 12-23 are rejected under the judicially created doctrine of double patenting over claims 1-22 of U. S. Patent No. 5,872,052 (patent # 08/599,675) since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

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The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows: a method of manufacturing an integrated circuit, depositing a layer of non-dielectric material (silicon) over the substrate and remove the substrate leaving the residual non-dielectric material, converting the non-dielectric residual material into dielectric material.

Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968).

See also MPEP § 804.

These rejections are set forth in prior Office action, Paper No. 12.

(11) Response to Argument

A. Appellant contends that Examiner improperly rejects the term *undesirable* containing in claims 18-23 under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification. This is not found to be persuasive because the term *undesirable* is not fully and clearly disclosed in the specification.

In view of the specification, the polysilicon stringer is converted to insulating layer by oxidizing or nitridizing (see page 14, lines 9⁺ and figure 8 of the specification). It is well-known in the art that the polysilicon stringer at the bottom of the corner of the gate electrode will become a thicker insulating layer than other portion of the insulating layer on the sidewall of the gate electrode after oxidation. A thicker insulating layer is known to increase the

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insulation, which lowering the gate electrode leakage. Therefore, the polysilicon stringer as disclosed in the specification can be interpreted as a desirable feature instead of undesirable feature by artisan.

In view of the above, the rejection of *undesirable* under 35 U.S.C. 112, first paragraph, as containing the subject matter which was not fully described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention is proper.

B. Appellant contends that the term *spacer* as disclosed in the Kim's reference and the *stringer* as disclose in the present invention are two different structures which are not the same, equivalent, or interchangeable. This is not found to be persuasive because there is not seen the difference of spacers and the stringers between the Kim's reference and the claimed invention. Kim clearly teaches forming a non-dielectric material, polysilicon (18) over the gate structure (12, 13, 14) then removing a portion of a non dielectric material (18) leaving the spacer (18) (stringer) of the non-dielectric material in the creases as claimed in the steps b and c of the claims 12 and 18, respectively.

Appellant contends that in pages 13 and 14, “*stringers*” are *small, and undesirable residuals that are typically left in creases on a substrate after an etching process*. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., *small*) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification,

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limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Also the term *undesirable residuals* is not disclosed in the original disclosure of the specification.

Appellant contends that in regard to independent claim 12, none of the references of record disclose or suggest the removal of a portion of a dielectric layer of non-dielectric material, leaving stringers of the dielectric material in the creases on the integrated circuit, and converting these stringers of non-dielectric material into a dielectric material. This is not found to be persuasive because Kim teaches a method of manufacturing an integrated circuit comprising the steps of: forming features (12, 13, 14) on a substrate, the features protruding from the substrate to create creases adjacent the features (12, 13, 14), depositing a layer of non-dielectric material (18, polysilicon) over the features and the creases, removing a portion of the non-dielectric material (18, polysilicon) from the creases using a given method, leaving residual non-dielectric material (18, stringers) in some of the creases, and converting the residual non-dielectric material (18, stringers) in the creases into a dielectric material (22, oxide) (see figures 1-2, col.2, lines 50-68).

Appellant contends that in regard to independent claim 18, none of the references of record disclose or suggest the removal of non-dielectric material from creases where the removal method leaves undesirable residual non-dielectric material in some of the creases, along with the conversion of the undesirable residual non-dielectric material into the dielectric material. This is not found to be persuasive because the term *undesirable residuals* is not

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disclosed in the original disclosure of the specification. And Kim teaches forming leaving residual non-dielectric material in some of the creases (spacers/stringers, 18) as described above.

Appellant contends that examiner's interpretation of the Kim reference is inaccurate and nothing more than a blatant and improper usage of hindsight. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Appellant contends that the Matsuoka patent is not related to problems arising from undesirable non-dielectric residuals remaining after an etching step. This is found not to be persuasive because undesirable non-dielectric residuals is not disclosed in the specification and the Matsuoka is relied upon for nitridation process to form spacers (stringers).

C. Appellant's statements that Appellant will file an appropriate Terminal Disclaimer after the Board withdraw the rejection and allow claims 12-23 which are rejected by the examiner based on the judicially created doctrine of obviousness-type double patenting in view of U.S. Patent No. 5,872,052. This is found not persuasive because appellant fails to *timely*

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filed a terminal disclaimer during the prosecution in compliance with 37 CFR 1.321© may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application as set forth in the last Office Action by the examiner. See 37 CFR 1.130(b).

For the above reasons, it is believed that the rejections should be sustained.

The conference was held on 4/6/2000 in present of:

Charles Bowers (SPE)

C.B.

John Niebling (SPE)

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TN

Respectfully submitted,

Thanh Nguyen

April 7, 2000

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